Comments on the proposed new CR595 in Marquette county.

How many springtails does it take to grow one white pine? How does the white pine get access to the nitrogen it needs so badly from these springtails? Well part of this is known after serious study for the past 20 years or so, but little has trickled into the forestry schools, let alone many well intentioned foresters. Well I don't know if anyone has figured an estimate of the number of springtails to grow a white pine, but it must be some enormous amount. Then comes the fact that we don't yet know what chemical that the fungus helping feed the white pines makes, and even more importantly where the fungus gets the ingredients it uses. Mycorrhizal relationships that most wild plants have are very complex in order to do things such as keep a springtail in animated suspension, or say a hibernation like state so the fungus can use nitrogen molecules to barter with the white pine for photosynthetic molecules of starch and sugars that are quite rare in the fungal world. The fungus typically is also connected to who knows how many other plants if they are available to it, and this is perhaps where it gets the components to make

the compound to control the springtails. This part is not known yet, but there would be a lot of interested scientists wanting to study that chemical for perhaps improving everything from anesthesia to seizures or tremors in humans. In order to do all this we have to maintain some of these reserves of biodiversity to be able to presently study these billions of organisms in situ, as 95 percent are so specifically evolved and interconnected they can't be moved and live.

The road will slice through this sort of large ecosystem with ore trucks rumbling noise and vibrations, thus affecting both major and micro habitats in this area of rough topography. The road will also contribute massive amounts of sediments to streams in this steep terrain. This will further affect the rare little trout streams, as will the new easier access to fisherman. Some reasonably remote areas have to be left mostly unmanaged by man, other than to try to represent how nature built such wonders in the first place.

Slicing through the large organisms (fungal plants, clones and colonies

of other organisms dependent on size) to create the road has massive affects on the stability of these rare ecosystems. The road would restrict the movement of small animals that hesitate to cross much lesser paths. Try as I might, I have myself been unable to miss the frantic chipmunk or red squirrel that finds me meeting it in a very large vehicle, though small compared to an ore truck. It will increase the ability for the introduction of disease and invasive species that larger, relatively undisturbed (in many places) ecosystem segments prevent. The road would provide access for illegal and legal hunters, thus threatening the viability of the large species like moose in the area. The road would also create edge effects and blowdowns that are now much less likely. Lake effect precipitation seeding from ore dust from the whole project, and the pollution will be caused by the 50 ton ore trucks in this presently very wild area.

The soil ecosystem, tens of thousands or more organisms not even scientifically named will be killed. About 95 percent of them, as they aren't even transferable to the lab by scientists to study how this

complexity that god and mother nature has created over the millennia work together. The many medicines and other important product s that have come from the the small percentage of organisms that can be studied further in the lab. The untrained person will say well just go over to the wilderness area near by and get the species you need. Well there is a major problem with that, which is the species that have helped create so many drugs for cancer, immunosuppression, and other uses don't seem to occur in other areas. The diversity and interdependence of the organisms in these soil ecosystems is so specialized that is why extremely careful attempts to move them to the lab for further study has not worked for about 95 percent of the organisms in this amazing ecosystem. This is also true of just minor management let alone a paved haul road for huge trucks grinding and speeding through the area. In the process losing some of the light asbestos fibers that are incorporated with all hard rock minerals in upper Michigan. There are all forms chrysotile being the most easily identified by me a less than professional geologist, but has learned a lot just to look for plants that are specific to certain substrates. In spite of this I see no reference from the Eagle

Project other than general dust size control attempts that are said to be planned, but no mention of what the dust contains. I wonder why that would be?

Coincidently as I was finishing this up there was a new law passed by the Michigan house (HB 4601) to limit asbestos liability of the parent company from the problems a small subsidiary, which may represent only a small part of the overall firm's value. This was voted on in the senate as well and positively by Sen. Tom Casperson whose family is in the timber business as a trucking company. This area and all its bird's eye maple and other high priced timber haven't been easily available. So much so that there has been a fair amount of helicopter logging in the area. In talking to Senator Casperson my wife was told to sue Rio Tinto if she didn't like the proposed road.

From cyclosporine first discovered in a Norway forest reserve soil sample in the 1960s and by about 1980 changed the whole outlook for people that needed organ transplants to the more recent rapamycin

found in a soil sample from remote Easter Island and also has resulted in transplant help, but is also showing strong abilities to help fight some cancers. Well over half (60-70 percent) of our new drugs come from areas like this, and with the quickly evolving situation of drug, herbicide, and pesticide resistance in the many changing organisms, we can ill afford to destroy yet another remote landscape.

I was unable to get a copy of the final map or report on even the botanical work in the area that I have been a consultant most of my adult life. Thus the aged and worn body that can't just travel anywhere with a few days notice to look at one copy of the large document. I therefore have to assume that the botanical part was the same or much the same as the quite poorly one done previously. The assumptions by people that did it were ludicrous on their face. They decided to only look for plants that had already been located in Marquette county. I guess rarities from the Keweenaw, of which there are many would not grow here, but just haven't been found yet in this sparsely collected part of the county? What about rarities from closer Baraga and Alger counties? The sad

assumption was to not look for plants listed to "only" grow on limestone, well there is very little limestone in Marquette county, so if they knew anything about calciphiles they would have noticed that a strong one, white cedar is all over areas of mineralized basaltic group rock in this area, and thus the rock has mineral combinations that mimic limestone to the many plants that prefer limestone. In fact this is where I and other botanists over the years have found many rarities for Marquette and other counties in the western UP. Yet in their over all species list they have a threatened plant listed for Michigan, but weren't even aware that it was so listed apparently because it wasn't on their list of Marquette county plants to look for. If other scientists over the years had taken this approach, there would be no discussion, for Rio TInto would never have found the ore body of nickel and copper, as very little copper had been found in Marquette county and almost no nickel in not only Marquette county, but the whole United States.

So this was a report done so poorly it was hardly worth wasting time looking at, if one was interested in discovering what rare plants might be

in the corridor and adjacent areas to the proposed road. I would have not found new plants to science, the United States, Michigan, 100s of county records and indeed in the areas along the road corridor. There are plants that haven't been resolved scientifically from the area that I first collected in the 1990s. Many have been played with politically, but that is hardly science of any sort, now is it? I have collected in Wildcat Canyon a grape fern (Botrychium) that looks like the western states Botrychium lanceolatum v. lanceolatum, which has never been found in the east and differs genetically somewhat from the western one. The herbarium curator at the University of Michigan Herbarium was interested and in their large collections could only find one other location for this plant in the western part of Ontario, also in the Lake Superior drainage basin. This is only one of of many apparently new grape ferns that grow in this area. These plants don't have root hairs and seem to need the relatively undisturbed areas like this to get a full expression of their species diversity, rather than just a couple species as in the more managed areas of forest that this area doesn't allow at this point due to its rugged terrain.

One of the other places I have botanized one time is Cole's Creek Canyon that runs into the northwest corner of Silver Basin lake. This canyon is both very narrow and very straight walls in the mouth area, so that sun doesn't reach the bottom of it directly except for a brief time about 11 AM. this creates a unique habitat in this area and the bottom of the canyon in that area is populated by two western species of holly fern as the dominate vegetation. These are Polystichum braunii and P. lonchitis, both very rare in the east and Michigan. Who knows what other life forms will be found in these areas if the road and attending development doesn't occur in this area?

After going through the short time allowed to do this much commenting I can only conclude there is some other agenda than to spending all this time and money on this new road, than to just up grade CR510, Red road, on down through sleepy hollow right of way that already exists. Are there some ore bodies of interest up in this area? What is the big deal to mess with such an important area and avoid the much simpler

route I mentioned??? I am sure someone isn't telling something ahead of time as has happened so often already in this project.

If any documentation is needed for any of the science mentioned above, I can provide it, but since time to work on this was so short and Rio TInto - Kennecot hasn't exactly ever documented anything, I thought my very limited time was more wisely spent writing the rest.

Submitted Sincerely,

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Tamarack Studios